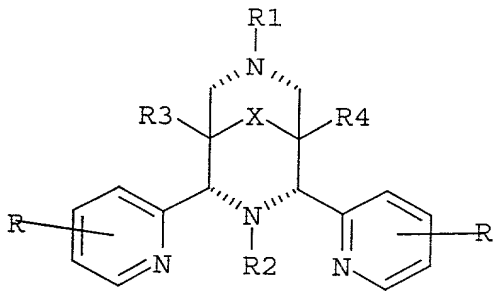
CLAIMS:

1. A bleaching composition comprising:

a) a monomer ligand or transition metal catalyst thereof of a ligand having the formula (I):



(I)

wherein each R is independently selected from: hydrogen, F, Cl, Br, hydroxyl, C1-C4-alkylO-, -NH-CO-H, -NH-CO-C1-C4-alkyl, -NH2, -NH-C1-C4-alkyl, and C1-C4-alkyl;
R1 and R2 are independently selected from:
C1-C4-alkyl,
C6-C10-aryl, and,
a group containing a heteroatom capable of coordinating to a transition metal, wherein at least one of R1 and R2 is the group containing the heteroatom;
R3 and R4 are independently selected from hydrogen, C1-C8 alkyl, C1-C8-alkyl-O-C1-C8-alkyl, C1-C8-alkyl-O-C6-C10-aryl, C6-C10-aryl, C1-C8-hydroxyalkyl, and $-(CH2)_nC(O)OR5$ wherein R5 is independently selected from: hydrogen, C1-C4-alkyl, n is from 0 to 4, and mixtures thereof; and,
X is selected from C=O, $-[C(R6)_2]_y-$ wherein Y is from 0 to 3 each R6 is independently selected from hydrogen, hydroxyl, C1-C4-alkoxy and C1-C4-alkyl; and,

b) the balance carriers and adjunct ingredients.

2. A bleaching composition according to claim 1, wherein R1 and R2 are both selected from a group containing a heteroatom capable of coordinating to a transition metal.

3. A bleaching composition according to claim 1, wherein the group containing the heteroatom is:
a heterocycloalkyl: selected from the group consisting of: pyrrolinyl; pyrrolidinyl; morpholinyl; piperidinyl; piperazinyl; hexamethylene imine; 1,4-piperazinyl; tetrahydrothiophenyl; tetrahydrofuranyl; tetrahydropyranyl; and oxazolidinyl, wherein the heterocycloalkyl may be connected to the ligand via any atom in the ring of the selected heterocycloalkyl,
a -C1-C6-alkyl-heterocycloalkyl, wherein the heterocycloalkyl of the -C1-C6-heterocycloalkyl is selected from the group consisting of: piperidinyl; piperidine; 1,4-piperazine,tetrahydrothiophene; tetrahydrofuran; pyrrolidine; and tetrahydropyran, wherein the heterocycloalkyl may be connected to the -C1-C6-alkyl via any atom in the ring of the selected heterocycloalkyl,
a -C1-C6-alkyl-heteroaryl, wherein the heteroaryl of the -C1-C6-alkylheteroaryl is selected from the group consisting of: pyridinyl; pyrimidinyl; pyrazinyl; triazolyl; pyridazinyl; 1,3,5-triazinyl; quinolinyl; isoquinolinyl; quinoxalinyl; imidazolyl; pyrazolyl; benzimidazolyl; thiazolyl; oxazolidinyl; pyrrolyl; carbazolyl; indolyl; and isoindolyl, wherein the heteroaryl may be connected to the -C1-C6-alkyl via any atom in the ring of the selected

heteroaryl and the selected heteroaryl is optionally substituted by -C1-C4-alkyl,
a -C0-C6-alkyl-phenol or thiophenol,
a -C2-C4-alkyl-thiol, thioether or alcohol,
a -C2-C4-alkyl-amine, and
a -C2-C4-alkyl-carboxylate.

4. A bleaching composition according to claim 1, wherein: each R is the same; and R3 = R4.

5. A bleaching composition according to claim 1, wherein R3 and R4 are the same and are $-(CH2)_nC(O)O$-C1-C4-alkyl.

6. A bleaching composition according to claim 1, wherein R3 and R4 are selected from the group consisting of -CH2OH, -C(O)O-C1-C6-alkyl, and phenyl.

7. A bleaching composition according to claim 1, wherein at least one R1 and R2 is a 3-C0-C6-alkyl-pyridin-2-yl-C0-C6-alkyl.

8. A bleaching composition according to claim 1, wherein Y = 1

9. A bleaching composition according to claim 1, wherein R3 and R4 are -C(O)O-C1-C6-alkyl.

10. A bleaching composition according to claim 1, wherein at least one of R1 and R2 is selected from the group consisting of: 3-ethyl-pyridin-2-ylmethyl, pyridin-2-

ylmethyl, 3-methyl-pyridin-2-ylmethyl, and 6-amide-pyridin-2-ylmethyl.

11. A bleaching composition according to claim 10, wherein at least one of R1 and R2 is pyridin-2-ylmethyl.

12. A bleaching composition according to claim 1, wherein both R1 and R2 are pyridin-2-ylmethyl and R is H.

13. A bleaching composition according to claim 1, wherein X is C=O.

14. A bleaching composition according to claim 1, wherein the bleaching composition comprises the free ligand.

15. A bleaching composition according to claim 1, wherein the complex is of the general formula (A1):

$$[M_aL_kX_n]Y_m \qquad (A1)$$

in which:

M represents a metal selected from Mn(II)-(III)-(IV)-(V), Cu(I)-(II)-(III), Fe(II)-(III)-(IV)-(V), Co(I)-(II)-(III), Ti(II)-(III)-(IV), V(II)-(III)-(IV)-(V), Mo(II)-(III)-(IV)-(V)-(VI) and W(IV)-(V)-(VI);

X represents a coordinating species selected from any mono, bi or tri charged anions and any neutral molecules able to coordinate the metal in a mono, bi or tridentate manner;

Y represents any non-coordinated counter ion;

a represents an integer from 1 to 10;

k represents an integer from 1 to 10;

n represents an integer from 1 to 10;

m represents zero or an integer from 1 to 20; and

L represents a ligand as defined in claims 1 to 12, or its protonated or deprotonated analogue.

16. A bleaching composition according to claim 15, wherein M represents a metal selected from Fe(II)-(III)-(IV)-(V).

17. A bleaching composition according to claim 16, wherein M represents a metal selected from Fe(II) and Fe(III).

18. A ligand of formula (I) according to claim 1 or a transition metal catalyst thereof with the proviso that the following compounds are excluded:
dimethyl 2,4-di-(2-pyridyl)-3,7-bis-(pyridin-2-ylmethyl)-3,7-diaza-bicyclo[3.3.1]nonan-9-one-1,5-dicarboxylate;
1,5-bis-(hydroxymethylene)-2,4-di-(2-pyridyl)-3,7-bis-(pyridin-2-ylmethyl)-3,7-diazabicyclo[3.3.1]nonan-9-ol;
dimethyl 2,4-di-(2-pyridyl)-3,7-bis-(pyridin-2-ylethyl)-3,7-diaza-bicyclo[3.3.1]nonan-9-one-1,5-dicarboxylate;
dimethyl 2,4-di-(2-pyridyl)-3-(5-carboxypentyl)-7-methyl-3,7-diaza-bicyclo[3.3.1]nonan-9-one-1,5-dicarboxylate;
dimethyl 2,4-di-(2-pyridyl)-3-(2-methoxyethyl)-7-methyl-3,7-diaza-bicyclo[3.3.1]nonan-9-one-1,5-dicarboxylate; diethyl-2,4-dipyridyl-7-picolyl-3,7-diaza-bicyclo-[3.3.1]-nonan-9-one-1,5-dicarboxylate ; diethyl-2,4-dipyridyl-7-benzyl-3-hydroxyethyl-3,7-diaza-bicyclo-[3.3.1]-nonan-9-one-1,5-dicarboxylate; and, dimethyl-2,4-dipyridyl-7-benzyl-3-hydroxyethyl-3,7-diaza-bicyclo-[3.3.1]-nonan-9-one-1,5-dicarboxylate.

19. A ligand of formula (I) according to claim 18 or a transition metal catalyst thereof, wherein at least one of R1 or R2 is pyridin-2-ylmethyl and the other is selected from -CH3, -C2H5, -C3H7, and -C4H9.

20. A perchlorate salt of dimethyl 2,4-di-(2-pyridyl) -3,7-di(pyridin-2-ylmethyl)-3,7-diaza-bicyclo[3.3.1]nonan-9-one-1,5-dicarboxylate (N2Py4).